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#### EP 0 932 142 A3 (11)

(12)

### **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3: 15.03.2000 Bulletin 2000/11 (51) Int. Cl.7: G10L 3/02

(43) Date of publication A2: 28.07.1999 Bulletin 1999/30

(21) Application number: 99300462.1

(22) Date of filing: 22.01.1999

(84) Designated Contracting States: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE **Designated Extension States:** AL LT LV MK RO SI

(30) Priority: 23.01.1998 US 12529

(71) Applicant: DIGISONIX, LLC

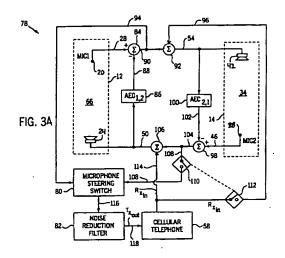
Madison, Wisconsin 53713-4644 (US)

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#### (54) Integrated vehicle voice enhancement system and hands-free cellular telephone system

An integrated vehicle voice enhancement system and hands-free cellular telephone system implements microphone steering techniques and noise reduction filtering to improve the intelligibility and clarity of transmitted signals. A microphone steering switch is provided for the cellular telephone interface which allows only one of the microphones to be switched in to an "on" state at any given time. The microphone steering switch generates a raw telephone input switch that is a combination of 100% of the designated primary microphone signal and approximately 20% of the microphone signals from microphones in the "off" state. In this manner, the telephone line does not appear dead to a listener on the other end of the telephone line when speech is not present in the telephone input signal. A noise reduction filter filters the raw telephone signal in the time domain in real time to improve the clarity of the telephone input signal when speech is present in the telephone input signal. A microphone steering switch for the voice enhancement system is also provided to implement switching between acoustically coupled microphones located within the vehicle.





## **EUROPEAN SEARCH REPORT**

Application Number EP 99 30 0462

	Citation of decomposit with in	ERED TO BE RELEVANT	Relevant	OLASSISION OF THE
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A	WO 97 34290 A (ERIC 18 September 1997 ( * page 1, line 5 - * page 11, line 14 figure 3 *	1997-09-18) line 19 *	24	TECHNICAL FIELDS SEARCHED (Int.Ci.6)
A	EP 0 640 953 A (CAN 1 March 1995 (1995- * page 5, column 8, column 10, line 15;	03-01) line 48 - page 6,	33	H04M G10K H04R
	PATENT ABSTRACTS OF vol. 017, no. 470 (1 26 August 1993 (1993 & JP 05 111020 A (M/ CO LTD), 30 April 19 * abstract *	33		
	The present search report has b	een drawn up for all claims	-	
	Place of search	Date of completion of the search	<del></del>	Examiner
	THE HAGUE	19 January 2000	Wan	zeele, R
X : parti Y : parti docu A : techi	ATEGORY OF CITED DOCUMENTS cularly relevant if taken alone cularly relevant if combined with anoth ment of the same category notogical background written dactoaure	L : document cited	ocument, but publicate in the application for other reasons	shed on, or



Application Number

EP 99 30 0462

CLAIMS INCURRING FEES
The present European patent application comprised at the time of filling more than ten claims.
Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.
LACK OF UNITY OF INVENTION
The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:
see sheet B
All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



# LACK OF UNITY OF INVENTION SHEET B

Application Number

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-23

Near-end and far-end echo cancelling, microphone steering and noise reduction filtering of echo-cancelled signals for voice enhancement.

2. Claims: 24-32

Noise reduction filtering of background vehicle noise

3. Claims: 33-37

Voice activated switching

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## ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 99 30 0462

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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